PATENT
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Response Under 37 CFR 1.111

IN THE CLAIMS

1. (*Previously presented*) A power semiconductor device comprising:

a semiconductor substrate with two surfaces, an N+ doped layer extending into the substrate from one surface thereof, an N- doped layer over the N+ doped layer, a P- doped well formed in the N- doped layer and extending from the other surface of the substrate into the N- doped layer, a P+ doped region formed in the P- doped well and extending from the other surface of the substrate into the P-doped well, an N+ doped region formed in the other surface of the substrate and in the N- doped layer, said N+ region laterally spaced from the P+ doped region and the P- doped well, said P- doped well and P+ doped region having a combined thickness of about 5μm to about 12 μm; and

recombination centers comprising noble metal impurities disposed substantially in said N - doped layer and P - doped well.

2. (*Previously Presented*) The device of claim 1 wherein said P - doped well has a thickness of about 4 μm to about 10 μm.

3. (*Previously Presented*) The device of claim 1 wherein said P+ doped region has a thickness of about 0.1 μm to about 2 μm.

4. (*Previously Presented*) The device of claim 1 wherein said P - doped well has a dopant level of at least 10^{16} atoms/cm^3.

5. (*Previously Presented*) The device of claim 4 wherein said P - doped well has a dopant level of about 2.5x 10^{17} atoms/cm^3.

6. (*Previously Presented*) The device of claim 1 wherein said P+ doped region has a dopant level of at least 10^{18} atoms/cm^3.

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7. (*Previously Presented*) The device of claim 6 wherein said P+ doped region has a dopant level of about $6x10^{19}$ atoms/cm^3.

8. (*Previously Presented*) The device of claim 1 wherein said N - doped layer has a dopant level of about 10^{14} atoms/cm^3 to about 10^{15} atoms/cm^3.

9. (*Cancelled*).

10. (*Original*) The device of claim 1 wherein said noble metal impurities are selected from the group consisting of gold, platinum, and palladium.

11. (*Original*) The device of claim 10 wherein said noble metal impurities comprise platinum.

12. (*Previously Presented*) The device of claim 11 wherein said recombination centers are formed by platinum diffusion through said N + doped substrate into said N - doped and P - doped well.

13. (*Original*) The device of claim 11 containing platinum impurities at a concentration of about $1x10^{15}$ to about $1x10^{16}$ atoms/cm^3.

14. (*Original*) The device of claim 13 wherein said concentration of platinum impurities is about $2 x10^{15}$ atoms/cm^3.

15. (*Original*) The device of claim 1 further comprising an N + doped region disposed in said N - doped layer.

16. (*Cancelled*).

17. (*Previously Presented*) The device of claim 16 comprising a diode, MOSFET or an IGBT power device.

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18. – 34. Cancelled

35. *(Currently amended)* A power semiconductor device comprising:

a semiconductor substrate with two surfaces, an N+ doped layer extending into the substrate from one surface thereof, an N- doped layer over the N+ doped layer, a P- doped well formed in the N- doped layer and extending from the other surface of the substrate into the N- doped layer, said P-layer having a first thickness and forming a first boundary with the N- doped layer, a P+ doped region formed in the P- doped well and extending from the other surface of the substrate into the P-doped well to have a second thickness and to form a second boundary between the P+ doped region and the P- doped well, an N+ doped region formed in the other surface of the substrate, said N+ doped region having a third thickness and forming a third boundary between the N+ doped region and the P-well or the N-doped layer,

wherein the P+ doped region is vertically thinner than the P- doped well and vertically thinner than the N+ doped region , and

recombination centers comprising noble metal impurities disposed in said N- doped layer and said P - doped well.

36. *(Previously presented)* The device of claim 35 wherein the second boundary is more shallow than the first or third boundaries.

37. *(Previously presented)* The device of claim 35 wherein the ratio of thickness of the P+ doped region to the P-doped well is between 1:40 and 1:5.

38. *(Previously presented)* The device of claim 37 wherein the P+ doped region is between 0.1 to 2.0 μm thick and the P-doped well is between 4.0 and 10.0 μm thick.

39. *(Previously presented)* The device of claim 35 wherein the N+ doped region is separated from the P-doped well by the N-doped layer.

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40. (*Previously presented*) The device of claim 35 wherein the N+ doped region is within the P-doped well.

41. (*Previously presented*) The device of claim 40 wherein the N+ doped region abuts the P+ doped region.

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